

Appl. No. 10/099,621
Amdt. Dated July 12, 2004
Reply to Office Action of May 27, 2004

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

I claim:

Claim 1 (previously amended): A variable attenuator assembly for attenuating optical signals transmitted between a first and a second optical fibers, comprising:

- a plug-type connector terminating the second optical fiber;
- a coupling sleeve open at two opposite ends; and
- a variable attenuating connector (VAC) terminating the first optical fiber, comprising:
 - a stationary housing defining a longitudinally extending bore and having a rear end;
 - a connecting member attached to the rear end of the stationary housing and defining an internally-threaded bore;
 - a tubular knob having an external thread of a first screw pitch and an internal thread of a second screw pitch, the first and second screw pitches being different from each other, the tubular knob being partially received in the connecting member with the external thread of the knob mating with the internally-threaded bore of the connecting member; and

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a ferrule holder defining a central bore adapted to receive and retain an optical fiber therein, the holder being received in the tubular knob and the stationary housing and having an external thread mating with the internal thread of the knob;

wherein rotating the knob induces a first linear displacement of the knob with respect to the connecting member and the stationary housing and a second linear displacement of the holder with respect to the knob, the first linear displacement being dependent upon the first screw pitch and the second linear displacement being dependent upon the second screw pitch, whereby the optical fiber is moved with the holder an overall displacement corresponding to the sum of the first and second linear displacements; wherein

a biasing element is radially arranged between said stationary housing and said ferrule holder to urge the ferrule holder forwardly; wherein

said stationary housing is of a one-piece integrally formed type, and a discrete clip is inserted into said stationary housing to abut against a rear end of the biasing element.

Claim 2 (previously amended): The variable attenuator assembly as claimed in claim 1, wherein the variable attenuating connector further comprises a mounting member attached to the rear end of the stationary housing and defining an external-threaded section and a bore.

Claim 3 (previously amended): The variable attenuator assembly as claimed in claim 1, wherein the internal thread and the external thread of the knob are arranged such that the first and second displacements are in opposite directions whereby the overall displacement of the optical fiber relative to the stationary

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housing is the difference between absolute values of the first and second displacements.

Claim 4 (previously amended): The variable attenuator assembly as claimed in claim 1, further comprising an external housing mounted to a front end of the stationary housing for securing the variable attenuating connector to the coupling sleeve.

Claim 5 (canceled)

Claim 6 (currently amended): The variable attenuator assembly as claimed in claim 1, wherein the biasing element comprises a helical spring disposed between a front end of the ferrule holder and the clip inside the stationary housing.

Claim 7 (currently amended): The variable attenuator assembly as claimed in claim 1, wherein the connecting member forms two grooves which engagingly receive two holding beams formed at the rear end of the stationary housing.

Claim 8 (previously amended): The variable attenuator assembly as claimed in claim 1, wherein the ferrule holder has an enlarged front end forming a receptacle which receives and retains a ferrule to which the optical fiber is attached.

Claim 9 (currently amended): The variable attenuator assembly as claimed in claim 1, wherein the ferrule holder forms radially protruding stoppers engaging in keyways defined in sides of the stationary housing for preventing rotation of the holder relative to the stationary housing.

Claim 10 (previously amended): A variable attenuating connector (VAC) terminating a first optical fiber, comprising:

a stationary housing defining a longitudinally extending bore and having a rear end;

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a connecting member attached to the rear end of the stationary housing and defining an internally-threaded bore;

a tubular knob having an external thread of a first screw pitch and an internal thread of a second screw pitch, the first and second screw pitches being different from each other, the tubular knob being partially received in the connecting member with the external thread of the knob mating with the internally-threaded bore of the connecting member; and

a ferrule holder defining a central bore adapted to receive and retain the first optical fiber therein, the holder being received in the tubular knob and the stationary housing and having an external thread mating with the internal thread of the knob;

wherein rotating the knob induces a first linear displacement of the knob with respect to the connecting member and the stationary housing and a second linear displacement of the holder with respect to the knob, the first linear displacement being dependent upon the first screw pitch and the second linear displacement being dependent upon the second screw pitch, whereby the optical fiber is moved with the holder an overall displacement corresponding to the sum of the first and second linear displacements; wherein

a biasing element is radially arranged between said stationary housing and said ferrule holder to urge the ferrule holder forwardly; wherein

said stationary housing is of a one-piece integrally formed type, and a discrete clip is inserted into said stationary housing to abut against a rear end of the biasing element.

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Claim 11 (previously amended): The variable attenuating connector as claimed in claim 10, further comprising a mounting member attached to the rear end of the stationary housing and defining an external-threaded section and a bore.

Claim 12 (previously amended): The variable attenuating connector as claimed in claim 10, wherein the internal thread and the external thread of the knob are arranged such that the first and second displacements are in opposite directions whereby the overall displacement of the optical fiber relative to the stationary housing is the difference between absolute values of the first and second displacements.

Claim 13 (previously amended): The variable attenuating connector as claimed in claim 10, further comprising an external housing mounted to a front end of the stationary housing for securing the variable attenuating connector to a coupling sleeve.

Claim 14 (canceled)

Claim 15 (currently amended): The variable attenuating connector as claimed in ~~claim 1~~ claim 10, wherein the biasing element comprises a helical spring disposed between a front end of the ferrule holder and the clip inside the stationary housing.

Claim 16 (currently amended): The variable attenuating connector as claimed in claim 10, wherein the connecting member forms two grooves which engagingly receive two holding beams formed at the rear end of the stationary housing.

Claim 17 (previously amended): The variable attenuating connector as claimed in claim 10, wherein the ferrule holder has an enlarged front end forming a receptacle which receives and retains a ferrule to which the optical fiber is attached.

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Claim 18 (currently amended): The variable attenuating connector as claimed in claim 10, wherein the ferrule holder forms radially protruding stoppers engaging in keyways defined in the sides of the stationary housing for preventing rotation of the holder relative to the stationary housing.

Claim 19 (previously amended): A variable attenuator assembly for attenuating optical signals transmitted between first and second optical fibers, comprising:

- a coupling sleeve open at opposite first and second ends;
 - a plug-type connector having the second optical fiber, being inserted into the coupling sleeve through said second end; and
 - a variable attenuating connector having the first optical fiber, being inserted into the coupling sleeve through said first end,
- said variable attenuating connector comprising:
- a stationary housing retained in the coupling sleeve;
 - a stationary connection member located around a rear portion of the stationary housing and providing an internally threaded bore therein;
 - a rotatable tubular knob defining an external thread with a first screw pitch and an internal thread with a second screw pitch, the external thread engaged within the threaded bore of the stationary connection member; and
 - a non-rotating ferrule holder holding the fiber therewith and extending axially in the stationary housing and the rotatable tubular knob,

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said ferrule holder providing an external thread engaged with the internal thread of the knob; wherein

rotation of the knob results in an axial linear displacement of said ferrule holder in an amount being a difference between the first screw pitch and the second screw pitch; wherein

a biasing element is radially arranged between said stationary housing and said ferrule holder to urge the ferrule holder forwardly; wherein

said stationary housing is of a one-piece integrally formed type, and a discrete clip is inserted into said stationary housing to abut against a rear end of the biasing element.